

**REMARKS**

A review of the claims indicates that:

- A) Claims 3, 6 and 7 remain in their original form.
- B) Claims 4, 5, 29, 30, 32—42, 44 and 45 are previously presented.
- C) Claims 1, 24, 25, 28, 31 and 43 are currently amended.
- D) Claims 2, 8—23, 26 and 27 were previously cancelled.

In view of the following remarks, Applicant respectfully requests reconsideration of the rejected claims and withdrawal of the rejections.

**Traversal of the §112 Rejections**

Claim 28—34 were rejected under Section 112 first paragraph because Claim 28 recited “heat provided to the fuel cell”. Without addressing the issue of whether the specification discloses this recitation, the Applicant has amended Claim 28 to recite “heat generated by the fuel cell”. That fuel cells can generate heat is supported by the specification at page 3 line 11 and other locations.

Claim 1 was rejected under Section 112 second paragraph. As the Applicant understands the rejection, the issue is ‘what requires more or less heat.’ To clarify Claim 1, the Applicant has amended the phrase “whether more or less heat is required” by adding “by the fuel cell system” to provide additional clarification. The Applicant submits that the claim is clear.

Claim 28 was rejected under Section 112 second paragraph. As the Applicant understands the rejection, the issue is ‘the temperature of what (is controlled).’ To clarify Claim 28, the Applicant has amended the phrase “configured to control temperature” by adding “of the fuel cell system” to provide additional clarification. The Applicant submits that the claim is clear.

Claims 31 and 43 recite “temperature changes”, which the Office suggested is indefinite and/or contained inadequate antecedent basis. The Applicant has amended Claims 31 and 43 to recite “changes in temperature of the fuel cell system”. It is believed that the claims are clear in meaning, and that they contain proper antecedent basis.

#### **Traversal of the §102 Rejections**

Claims 1 and 3—7, 24, 25 and 28—45 stand rejected under 35 U.S.C. §102(e) as being unpatentable over U.S. 2003/0008184 A1, hereinafter “Ballantine” in view of U.S. In response, the Applicant respectfully traverses the rejection.

**Claim 1** recites a fuel cell system, configured to control temperature by regulating serial vs. parallel configuration of fuel cells within the system, the system comprising:

- first and second fuel cells capable of providing an electrical output; and
- a controller configured for regulating temperature of the fuel cell system by controlling serial vs. parallel configuration of the first and second fuel cells, wherein the controller is configured to identify whether more or less heat is required by the fuel cell system, and wherein the controller is in communication with:
  - a switch circuit comprising one or more switches for arranging the electrical output of the first fuel cell and the electrical output of the second fuel cell in parallel or series; and
  - a temperature measurement circuit capable of measuring the temperature of the first fuel cell or the second fuel cell and providing a signal to the controller;
- wherein the controller utilizes the switch circuit to switch to a more serial configuration if more heat is required and switches to a more parallel configuration if less heat is required.

Claim 1 has been amended for clarity, but not for scope.

1 Claim 1 recites, "wherein the controller utilizes the switch circuit to switch  
2 to a more serial configuration if more heat is required and switches to a more  
3 parallel configuration if less heat is required". The references of record fail to  
4 teach or suggest regulation of temperature wherein a more serial configuration is  
5 used if more heat is required and a more parallel configuration is used if less heat  
6 is required. In fact, the Ballantine reference discloses the opposite.

7 The Ballantine reference discloses the use of serial vs. parallel  
8 configurations to regulate heat production. At the last lines of [0015], Ballantine  
9 discloses connecting fuel cells in parallel to respond to a demand for heat. At  
10 [0090], Ballantine discloses operating cells in parallel to produce more heat.  
11 Similarly, in paragraphs [0095], [0097], [0129], [0130] and the end of Claim 5,  
12 Ballantine uniformly discloses configuring a stack of cells in a parallel  
13 configuration to create additional heat.

14 In contrast, the Applicant's Claim 1 recites the opposite, i.e. switching "to a  
15 more serial configuration if more heat is required" and switching "to a more  
16 parallel configuration if less heat is required".

17 The Patent Office points to Ballantine at [0013] and [0130], and suggests  
18 that Ballantine anticipates the elements of Claim 1. The Applicant respectfully  
19 disagrees.

20 Referring to [0013], Ballantine does not actually state which configuration,  
21 parallel or series, results in greater heat production. However, first several lines of  
22 [0130], Ballantine discloses use of a parallel configuration to create more heat  
23 energy. This disclosure is not what the Applicant recited in Claim 1, wherein the  
24 Applicant recited using "the switch circuit to switch to a more serial configuration  
25

1 if more heat is required and switches to a more parallel configuration if less heat is  
2 required". Thus, Ballantine has failed to disclose that a serial configuration results  
3 in greater heat production, and in fact discloses the opposite.

4 Therefore, the Applicant respectfully submits that Ballantine discloses  
5 something very different than is recited by the Applicant's claim. In particular,  
6 Ballantine discloses an opposite configuration (a parallel configuration) to create  
7 additional heat. In contrast, the Applicant has claimed a serial configuration used  
8 to create additional heat. Accordingly, the Applicant respectfully requests that the  
9 Section 102 rejection of Claim 1 be removed and that claim be allowed to issue.

10 **Claims 3—7** depend from Claim 1 and are allowable as depending from an  
11 allowable base claim, as well as for their recitation of elements not seen in the  
12 prior art of record. These claims are also allowable for their own recited features  
13 that, in combination with those recited in Claim 1, are neither taught nor suggested  
14 in references of record, either singly or in combination with one another.

15  
16 **Claim 28** recites a fuel cell system, configured to control temperature of the  
17 fuel cell system by regulating a serial vs. a parallel configuration of cells within  
18 the system, the fuel cell system comprising:

- 19 • a controller configured to identify whether more or less heat is  
20 required by the fuel cell system, and to increase or decrease heat  
21 generated by the fuel cell system by regulating a serial vs. a parallel  
22 configuration of cells within the system;
- 23 • a temperature measurement circuit, in communication with the  
24 controller, configured to measure temperature of at least one fuel cell  
25 and to provide a signal to the controller; and
- a switching circuit to arrange the first and second fuel cells in a  
parallel or a series configuration in response to the controller;
- **wherein the controller utilizes the switching circuit to switch to a  
more serial configuration if more heat is required and to switch  
to a more parallel configuration if less heat is required.**

1 Claim 28 has been amended for clarity, but not for scope.

2 Claim 28 recites a controller that “utilizes the switching circuit to switch to  
3 a more serial configuration if more heat is required and to switch to a more  
4 parallel configuration if less heat is required”. In contrast, Ballantine discloses  
5 that a parallel configuration is used if more heat is required.

6 The Applicant incorporates the above remarks at this location, and notes  
7 that the Office rejected Claims 1, 28, 34 and 40 in a single section of the Action  
8 mailed 05/16/2007.

9 Therefore, the Applicant respectfully submits that Ballantine discloses  
10 something very different than is recited by the Applicant’s claim. In particular,  
11 Ballantine discloses an opposite configuration (a parallel configuration) to create  
12 additional heat. In contrast, the Applicant has claimed a serial configuration used  
13 to create additional heat. Accordingly, the Applicant respectfully requests that the  
14 Section 102 rejection of Claim 28 be removed and that claim be allowed to issue.

15 **Claims 29—33** depend from Claim 28 and are allowable as depending  
16 from an allowable base claim, as well as for their recitation of elements not seen in  
17 the prior art of record. These claims are also allowable for their own recited  
18 features that, in combination with those recited in Claim 28, are neither taught nor  
19 suggested in references of record, either singly or in combination with one  
20 another.

1 **Claim 34** recites a fuel cell system, configured to alternate between serial  
2 vs. parallel configurations of fuel cells within the system based on heat required by  
3 the system, the fuel cell system comprising:

- 4 • means for controlling the fuel cell system, wherein the means for  
5 controlling is configured to identify whether more or less heat is  
6 required by the fuel cell system;
- 7 • means for measuring temperature within one or more fuel cells and  
8 for communicating with the means for controlling the fuel cell; and
- 9 • means for switching the fuel cells between a parallel configuration  
10 and a serial configuration, in response to direction from the means  
11 for controlling the fuel cell;
- 12 • **wherein the means for controlling the fuel cell utilizes the means  
13 for switching to switch the fuel cell system to a more serial  
14 configuration if more heat is required and to switch the fuel cell  
15 system to a more parallel configuration if less heat is required.**

16 Claim 34 has not been amended.

17 Claim 34 recites means for controlling the fuel cell that “utilizes the means  
18 for switching to switch the fuel cell system to a more serial configuration if more  
19 heat is required and to switch the fuel cell system to a more parallel configuration  
20 if less heat is required”. In contrast, Ballantine discloses that a parallel  
21 configuration is used if more heat is required.

22 The Applicant incorporates the above remarks at this location, and notes  
23 that the Office rejected Claims 1, 28, 34 and 40 in a single section of the Action  
24 mailed 05/16/2007.

25 Therefore, the Applicant respectfully submits that Ballantine discloses  
something very different than is recited by the Applicant’s claim. In particular,  
Ballantine discloses an opposite configuration (a parallel configuration) to create  
additional heat. In contrast, the Applicant has claimed a serial configuration used  
to create additional heat. Accordingly, the Applicant respectfully requests that the  
Section 102 rejection of Claim 34 be removed and that claim be allowed to issue.

1       **Claims 35—39** depend from Claim 34 and are allowable as depending  
2 from an allowable base claim, as well as for their recitation of elements not seen in  
3 the prior art of record. These claims are also allowable for their own recited  
4 features that, in combination with those recited in Claim 34, are neither taught nor  
5 suggested in references of record, either singly or in combination with one  
6 another.

7  
8       **Claim 40** recites a fuel cell system, configured to regulate temperature by  
9 alternating between increased and decreased heat production, the fuel cell system  
10 comprising:

- 11       • a temperature measurement circuit configured to measure
- 12       temperature of fuel cells within the system;
- 13       • a switching circuit to change an arrangement of the fuel cells in
- 14       either direction between a parallel configuration and a serial
- 15       configuration; and
- 16       • a controller configured to receive temperature measurement
- 17       information from the temperature measurement circuit, to determine
- 18       whether more or less heat is required by the fuel cell system, and to
- 19       control the switching circuit and the configuration of the fuel cells,
- 20       **wherein the controller utilizes the switching circuit to switch to a**
- 21       **more serial configuration if more heat is required and to switch**
- 22       **to a more parallel configuration if less heat is required.**

23  
24       Claim 40 has not been amended.

25       Claim 40 recites means for controlling the fuel cell that “the controller  
utilizes the switching circuit to switch to a more serial configuration if more heat  
is required and to switch to a more parallel configuration if less heat is required”.  
In contrast, Ballantine discloses that a parallel configuration is used if more heat is  
required.

1       The Applicant incorporates the above remarks at this location, and notes  
2       that the Office rejected Claims 1, 28, 34 and 40 in a single section of the Action  
3       mailed 05/16/2007.

4       Therefore, the Applicant respectfully submits that Ballantine discloses  
5       something very different than is recited by the Applicant's claim. In particular,  
6       Ballantine discloses an opposite configuration (a parallel configuration) to create  
7       additional heat. In contrast, the Applicant has claimed a serial configuration used  
8       to create additional heat. Accordingly, the Applicant respectfully requests that the  
9       Section 102 rejection of Claim 40 be removed and that claim be allowed to issue.

10       **Claims 41—45** depend from Claim 40 and are allowable as depending  
11       from an allowable base claim, as well as for their recitation of elements not seen in  
12       the prior art of record. These claims are also allowable for their own recited  
13       features that, in combination with those recited in Claim 40, are neither taught nor  
14       suggested in references of record, either singly or in combination with one  
15       another.

16  
17       **Claim 24** recites a fuel cell system comprising:

- 18       • means for supplying an excess amount of fuel to a multiple fuel cell  
19       system;
- 20       • means for switching at least some of the fuel cells from a parallel  
21       electrical arrangement to a series electrical arrangement; and
- 22       • means for producing heat from at least some of the excess amount of  
23       fuel, **wherein the means for producing heat switches to a more**  
24       **serial configuration if more heat is required and switches to a**  
25       **more parallel configuration if less heat is required by the fuel**  
      **cell system.**



1 Claim 24 has been amended to recite, "wherein the means for producing  
2 heat switches to a more serial configuration if more heat is required and switches  
3 to a more parallel configuration if less heat is required". In contrast, Ballantine  
4 discloses that a parallel configuration is used if more heat is required.

5 The Applicant incorporates the above remarks at this location.

6 In view of these remarks, the Applicant respectfully submits that Ballantine  
7 discloses something very different than is recited by the Applicant's claim. In  
8 particular, Ballantine discloses an opposite configuration (a parallel configuration)  
9 to create additional heat. In contrast, the Applicant has claimed a serial  
10 configuration used to create additional heat. Accordingly, the Applicant  
11 respectfully requests that the Section 102 rejection of Claim 24 be removed and  
12 that claim be allowed to issue.

13  
14 **Claim 25** recites a fuel cell system comprising:

- 15 • means for supplying a substantially constant amount of fuel to a  
multiple fuel cell system;
- 16 • means for switching at least some of the fuel cells from a series  
electrical arrangement to a parallel electrical arrangement, **wherein**  
17 **the means for switching switches to a more serial configuration**  
**if more heat is required and switches to a more parallel**  
18 **configuration if less heat is required by the fuel cell system;**
- 19 • means for increasing EMF efficiency; and
- 20 • means for reducing fuel efficiency.

21 Claim 25 has been amended to recite, "wherein the means for switching  
22 switches to a more serial configuration if more heat is required and switches to a  
23 more parallel configuration if less heat is required". In contrast, Ballantine  
24 discloses that a parallel configuration is used if more heat is required.  
25

1 The Applicant incorporates the above remarks at this location.

2 In view of these remarks, the Applicant respectfully submits that Ballantine  
3 discloses something very different than is recited by the Applicant's claim. In  
4 particular, Ballantine discloses an opposite configuration (a parallel configuration)  
5 to create additional heat. In contrast, the Applicant has claimed a serial  
6 configuration used to create additional heat. Accordingly, the Applicant  
7 respectfully requests that the Section 102 rejection of Claim 25 be removed and  
8 that claim be allowed to issue.

9 **Conclusion**

10 The Applicant submits that the claims as presented are in condition for  
11 allowance. Accordingly, the Applicant respectfully requests that a Notice of  
12 Allowability be issued. If the Patent Office's next anticipated action is not the  
13 issuance of a Notice of Allowability, the Applicant respectfully requests that the  
14 undersigned attorney be contacted to schedule an interview.

15 Respectfully Submitted,

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17  
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By: 

David S. Thompson  
Reg. No. 37,954  
Attorney for Applicant

LEE & HAYES PLLC  
Suite 500  
421 W. Riverside Avenue  
Spokane, Washington 99201

Telephone: 509-324-9256 x235  
Facsimile: (509) 323-8979